



# Enabling open publishing

Building open tools with open communities

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# Publishing today

You and your colleagues have designed a study, collected data, analyzed the results, and written a paper ! 🎉

Now, you need to:



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Now, you need to:

- Send the paper to a journal



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Now, you need to:

- Send the paper to a journal
- Wait on the editor to find suitable reviewers



# Publishing today

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- Wait on the editor to find suitable reviewers
- Wait on the reviewers to provide revisions



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- Wait on the editor to find suitable reviewers
- Wait on the reviewers to provide revisions
- Address the revisions and re-submit



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- Wait on the editor to find suitable reviewers
- Wait on the reviewers to provide revisions
- Address the revisions and re-submit
- Correct the final proof and publish



# Publishing today

You and your colleagues have designed a study, collected data, analyzed the results, and written a paper ! 🎉

Now, you need to:

- ~~Send the paper to a journal~~
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- ~~Address the revisions and re-submit~~
- ~~Correct the final proof and publish~~

# The selfish scientist's guide to preprint posting



NKriegeskorte

March 13, 2016

commentary

open science,  
preprints

Preprint posting is the right thing to do for science and society. It enables us to share our results earlier, speeding up the pace of science. It also enables us to catch errors earlier, minimising the risk of alerting the world to our findings (through a high-impact publication) before the science is solid. Importantly, preprints ensure long-term open access to our results for scientists and for the public. Preprints can be rapidly posted for free on [arXiv](#) and [bioRxiv](#), enabling instant open access.

<https://nikokriegeskorte.org/2016/03/13/the-selfish-scientists-guide-to-preprint-posting/>

## Discussing preprints at journal clubs accelerates research

Journal clubs are a staple in academia. They are an opportunity for researchers to sit together and discuss what is new in science. Ironically, because journal clubs typically use published papers, the research is usually already old.

“

If you want to be one year behind, don't read bioRxiv ”

– Jeff Leek

<https://elifesciences.org/labs/57d6b284/prereview-a-new-resource-for-the-collaborative-review-of-preprints>

A photograph of a library with many wooden bookshelves filled with books. The books are of various colors and sizes, creating a textured background. The lighting is warm and slightly dim, highlighting the spines of the books.

**Open publishing creates *findable*  
and *accessible* science.**



A photograph of a library with many wooden bookshelves filled with books. The books are of various colors and sizes, creating a textured background. The lighting is somewhat dim, highlighting the spines of the books.

What about *interoperable* and  
*reusable* publishing?

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# Publishing today

You and your colleagues have designed a study, collected data, analyzed the results, and written a paper ! 🎉

Now, you need to:

- Send the paper to a journal
- Wait on the editor to find suitable reviewers
- Wait on the reviewers to provide revisions
- Address the revisions and re-submit
- Correct the final proof **and publish**

and publish



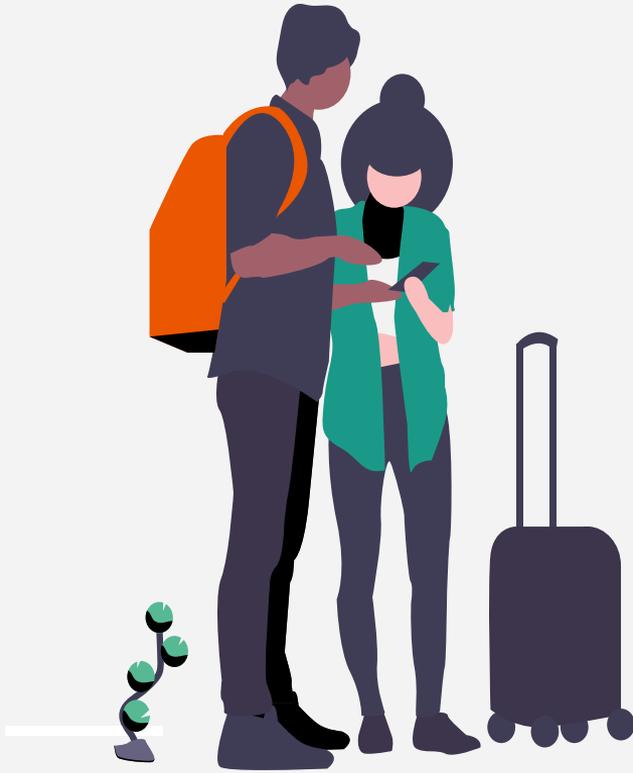
Olah & Carter (2017). Research Debt. *Distill.*



*An article about computational science in a scientific publication is not the scholarship itself, it is **merely advertising of the scholarship**. The actual scholarship is the complete software development environment and the complete set of instructions which generated the figures.*

Buckhelt and Donoho  
(paraphrasing John Claerbout)  
WaveLab and Reproducible Research, 1995

with thanks to [Chris Holdgraf](#)



How do we get to  
FAIR publishing in  
today's landscape?



A *community* of people and an *ecosystem* of open tools and standards for interactive computing.

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with thanks to [Chris Holdgraf](#)



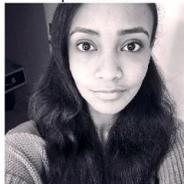
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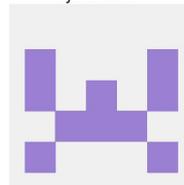
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Zsailer



you?





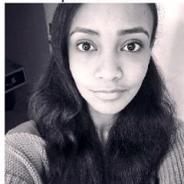
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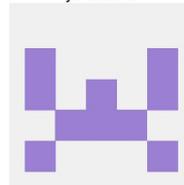
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rgbkrk



Ruv7



ryanlovelt



sgibson91



takluyver



tgeorgeux



willingc



yuvipanda



Zsailer



you?





Create things that are *language-agnostic* and *modular*.  
Empower people to use *other open tools*.

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# What can this kind of community enable?



# Jupyter Notebooks

The image displays two overlapping Jupyter Notebook windows. The background window shows a "Welcome to Jupyter" page with instructions on how to run Python code. The foreground window is titled "Lorenz Differential Equations" and contains the following content:

## Exploring the Lorenz System

In this Notebook we explore the [Lorenz system](#) of differential equations:

$$\begin{aligned}\dot{x} &= \sigma(y - x) \\ \dot{y} &= \rho x - y - xz \\ \dot{z} &= -\beta z + xy\end{aligned}$$

This is one of the classic systems in non-linear differential equations. It exhibits a range of complex behaviors as the parameters  $(\sigma, \beta, \rho)$  are varied, including what are known as *chaotic solutions*. The system was originally developed as a simplified mathematical model for atmospheric convection in 1963.

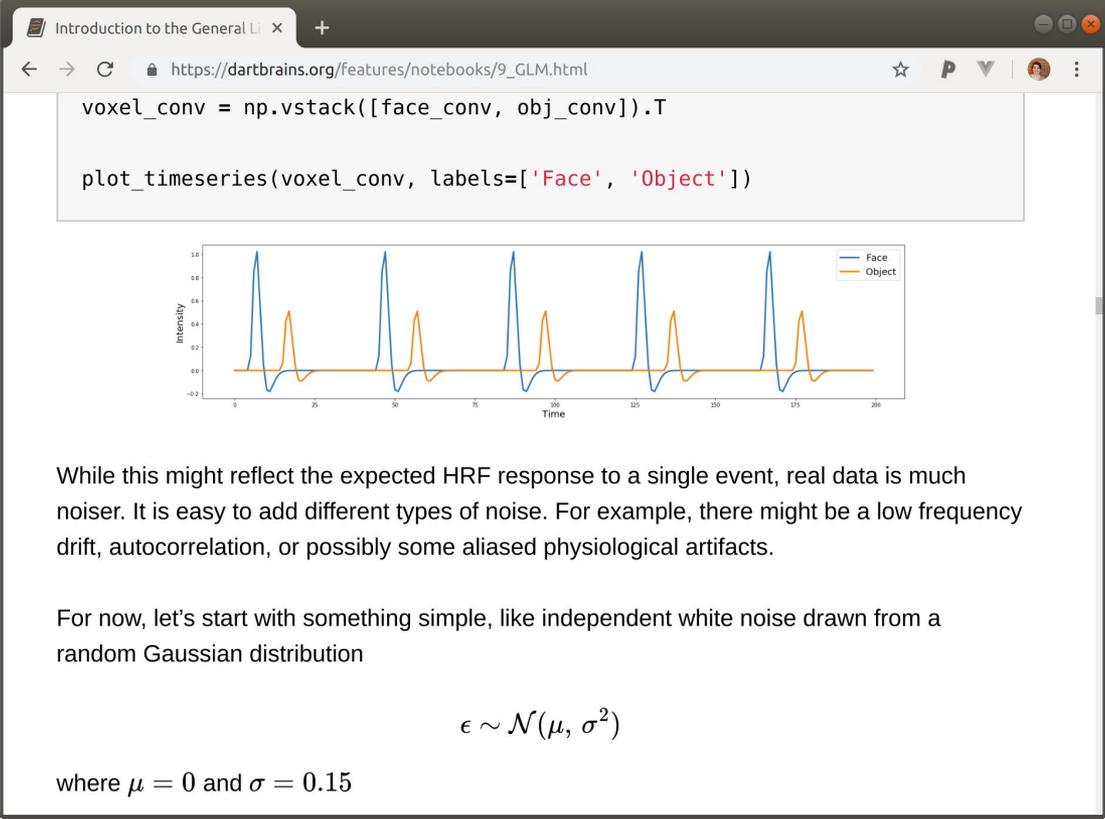
```
In [7]: interact(Lorenz, N=fixed(10), angle=(0., 360.),
                sigma=(0.0, 50.0), beta=(0., 5), rho=(0.0, 50.0))
```

The plot shows the Lorenz attractor with several sliders for parameters:

- angle: 308.2
- max\_time: 12
- $\sigma$ : 10
- $\beta$ : 2.6
- $\rho$ : 28

The plot displays a complex, chaotic attractor structure, characteristic of the Lorenz system, with multiple colored trajectories (red, blue, green, yellow) forming a butterfly-like shape.

# Jupyter Books



The screenshot shows a web browser window with a Jupyter notebook. The browser address bar shows the URL `https://dartbrains.org/features/notebooks/9_GLM.html`. The notebook contains two code cells. The first cell contains the code `voxel_conv = np.vstack([face_conv, obj_conv]).T`. The second cell contains the code `plot_timeseries(voxel_conv, labels=['Face', 'Object'])`. Below the code is a line plot with 'Intensity' on the y-axis (ranging from -0.2 to 1.0) and 'Time' on the x-axis (ranging from 0 to 200). The plot shows two time series: 'Face' (blue line) and 'Object' (orange line). Both series exhibit a series of periodic, sharp peaks. The 'Face' peaks are consistently higher, reaching approximately 1.0, while the 'Object' peaks are lower, reaching approximately 0.5. The peaks for both series occur at roughly the same time intervals, with the 'Face' peaks leading slightly. The baseline intensity for both series is near zero.

```
voxel_conv = np.vstack([face_conv, obj_conv]).T

plot_timeseries(voxel_conv, labels=['Face', 'Object'])
```

Intensity

Time

Face  
Object

While this might reflect the expected HRF response to a single event, real data is much noisier. It is easy to add different types of noise. For example, there might be a low frequency drift, autocorrelation, or possibly some aliased physiological artifacts.

For now, let's start with something simple, like independent white noise drawn from a random Gaussian distribution

$$\epsilon \sim \mathcal{N}(\mu, \sigma^2)$$

where  $\mu = 0$  and  $\sigma = 0.15$

# Binder



Turn a Git repo into a collection of interactive notebooks

Have a repository full of Jupyter notebooks? With Binder, open those notebooks in an executable environment, making your code immediately reproducible by anyone, anywhere.

Build and launch a repository

GitHub repository name or URL

GitHub ▾

Git branch, tag, or commit

Path to a notebook file (optional)

File ▾

launch

Copy the URL below and share your Binder with others:



Copy the text below, then paste into your README to show a binder badge:  launch binder



# Neurolibre



Loic Tetrel



Mathieu Boudreau



Elizabeth DuPre



Agah Karakuzu



FA Fortin



Darcy Quesnel



Shawn Brown



JB Poline



Samir Das



Pierre Bellec



Nikola Stikov



**N**eurolibre is a curated repository of interactive neuroscience notebooks, seamlessly integrating data, text, code and figures. Notebooks can be freely modified and re-executed through the web, offering a fully reproducible, “libre” path from data to figures. Neurolibre is powered by the [Binder](#) project, with computational resources provided by [CONP](#), [CBRAIN](#) and [Compute Canada](#).

# Aperture



[ohbm-aperture.github.io](https://ohbm-aperture.github.io)



# Thank you

Jean-Baptiste Poline

Chris Holdgraf

Cameron Craddock

Matteo Visconti Di Oleggio

Castello

Eugene Duff

Chris Gorgolewski

Katja Heuer

Greg Kiar

Ana Van Gulick

Camille Maumet

Tim van Mourik

Roberto Toro

Kirstie Whitaker

Pierre Bellec

Mathieu Boudreau

Shawn Brown

Samir Das

Félix-Antoine Fortin

Agah Karakuzu

Darcy Quesnel

Nikola Stikov

Loïc Tetrel



**McGill**  
UNIVERSITY



**HEALTHY BRAINS**  
FOR **HEALTHY LIVES**

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# Take Home Ideas

1. Open publishing means more than providing access to a PDF.
2. By creating tools in open communities, we can design modular, sustainable solutions.

